Samira Malek

Curriculum Vitae

Department of Electrical Engineering
Sharif University of Technology,Tehran,Iran
(+98) 912 6058776
+989126058776
samiramalek30@gmail.com
SamiraMalek.github.io

Education

2018–2020 **Masters of Electrical Engineerings, Communication Systems**, *Sharif University of Technology*, Tehran, Iran, *GPA – 3.61 out of 4 (16.97/20).*
Ranked as **1st** & **147th** university, respectively, in *Iran* & in *The World at Electrical Engineering* based on QS Ranking.

2013–2018 **Bachelor of Electrical Engineerings, Communication**, *Sharif University of Technology*, Tehran, Iran, *GPA – 3.26 out of 4 (16.34/20).*

2009–2013 **Diploma in Mathematics and Physics**, *Farzanegan High school (Administered by National Organization for Development of Exceptional Talents (NODET))*, Chahardangeh, Tehran Area, Iran, *GPA – 4 out of 4*.

Research Interests

- Data Science
- Machine & Deep Learning
- Vision & Signal Processing
- Information Theory

Honors and Awards

2018 **Ranked 29th** in the Iranian Nation-wide University Entrance Exam Known as Konkoor for M.Sc degree, among +40,000 test-takers.

2018 Received full scholarship from Sharif University of Technology in Master (tuition waived).

2013 **Ranked 40th** in the Iranian Nation-wide University Entrance Exam Known as Konkoor for B.Sc degree, among +80,000 test-takers.

2013 Received full scholarship from Sharif University of Technology in undergraduate (tuition waived).

2012 **Silver Medalist** of 30th Iranian National Mathematical Olympiad.

Thesis

Masters Thesis

Title **Using Deep Neural Networks for Decoding Linear Codes**

Supervisors Prof. Amini & Prof. Salehkaleybar

Description Decoding is treated as a classification problem at this approach, which is doomed by the curse of high dimensionality of training data sets. Afterwards, I designed two neural networks (NN) that follow symmetry conditions which help train decoding NN with a small fraction of data sets and preserve the same performance for all data. Besides, the proposed NN both improve the performance in terms of bit error rate (BER) and reduce the computational complexity of decoding with respect to previous work. The results of my first algorithm have been published in IWCIT, IEEE, 2020 and I used element-wise matrix multiplication instead of matrix multiplication, which is routinely used at NN, in my second design.

Bachelor Thesis

Title **Diagnosis of Eye Diseases by Using Recorded Signals from The Neural Retina**

Supervisors Prof. Hajipour

Description I explored the physiology of the Neural Retina and investigated how neurons would respond to different stimuli in experiments. My co-worker recorded MicroElectroRetinoGram (MERG) signal in *Royan Institute*. Afterwards, I wrote a code that could denoise a recorded signal and distinguish a healthy retina from unhealthy.

Publications

Published Samira Malek, Saber Salehkaleybar, Arash Amini, **"Multi Variable-layer Neural Networks for Decoding Linear Codes"**, Iran Workshop on Communication and Information Theory (IWCIT). IEEE, 2020.

Working Samira Malek, Saber Salehkaleybar, Arash Amini,**"A Deep Neural Network Architecture for Decoding Linear Codes Based on the Parity Check Matrix"** to be submitted (it's available *here*.) .

Selected Courses

Machine learning:

- Artificial Intelligence (A+)
- Machine & Deep Learning (self study)
- Probability and Statistics (A)
- Numerical Optimization Methods (B)

Signal Processing:

- Signal & System (A)
- Speech Processing (A+)
- Digital Signal Processing(I) (A+)
- Digital Signal Processing(II) (A)

Biomedical:

- Medical Imaging System (A+)
- Fundamentals of Bio-medical (A+)

Communication:

- Digital Communication (A)
- RF Communication Circuits (A+)
- Advanced Communication System(A)
- Electrical Circuits Theory(A)

Selected Academic Projects

Spring 2020 **Implementation of Viterbi algorithm & Reduced Complexity Viterbi Sequence Detector** in MATLAB, as a project of *Advanced Communication System* course, Under supervision of Prof. NasiriKenari.

Spring 2019 **Implementation of a FeedForward and a Recurrent Neural Networks for Pitch Tracking in Noisy Speech** in Keras**, Extraction pitch contours by SIFT, HPS, and AMDF algorithms** in MATLAB as projects of *Speech Processing* course, Under supervision of Prof. Ghaemmaghami.

Fall 2018 **Implementation of BFGS, Steepest Descent and Newton Algorithm** in MATLAB, as projects of *Numerical Optimization Methods* course, Under supervision of Prof. BabaieZadeh.

Fall 2018 **Recovering an image by IMAT and OMP algorithms, Reconstruction of 1-D and 2-D Signals by SDFT and RS Methods** in MathCad, as projects of *Digital Signal Processing(II)* course, Under supervision of Prof. Marvasti.

Spring 2016 **Design a Neural Network for Classification Right-handed and Left-handed Typing, with EEG Signal** in MATLAB, as a project of *Artificial Intelligence* course, Under supervision of Prof. Hajipour.

Spring 2015 **Implementation of a Pipeline MIPS Processor** in Verilog, as a project of *Microprocessor and Computer Architecture* course, Under supervision of Prof. Movahedin.

Fall 2013 **Implementation of a Semi-iudo Graphical Game** in C Language, as a project of *Principles of Computer Programming* course, Under supervision of Prof. TaherKhani.

Teaching Experiences

Fall 2019 Course Teaching Assistant of **Signal & system**, By Prof. NasiriKenari.

Spring 2019 Projects Design Assistant of **Statistics Random Process**(Graduate Course), By Prof. Behnia.

Spring 2019 Course Teaching, MATLAB Teaching and Assignments Design Assistant of **Engineering Mathematics**, By Prof. AhmadiBoroujeni.

2017–2018 Design **Mock test** of the Iranian Nation-wide University Entrance Exam Known as Konkoor for B.Sc degree in *Kanoon Institution*, which has the most participants in Iran (more than +20,000 students every year).

2014–2015 Teaching **Mathematics** at Farzanegan High school (NODET), Preparing students for Iranian National Mathematical Olympiad.

Computer skills

Languages	Python (Tensorflow & Keras), MATLAB, C/C++, LaTeX, Verilog, Assembly, HTML
Softwares	Anaconda, Spider, MathCad, Xilinx ISE, Modelsim
Hardware Platforms	FPGA, Microcontroller (AVR), DSP

Languages

English	**TOEFL iBT: 92**–July 2021 (Reading:22, Listening:25, Speaking:22, Writing:23) **GRE General:** will be taken soon.
Persian	Native

Hobbies and Interests

- Cooking
- Listening to Music
- Reading History & Psychology Books
- Dancing & Exercising

Reference

Prof. Amini, Arash, *Associate Professor*, Email: aamini@sharif.edu, Tel: (+98)(21) 6616 4382.

Prof. Salehkaleybar, Saber, *Assistant Professor*, Email: saleh@sharif.edu, Tel: (+98)21 6616 4394.